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(71) Applicant: PARLOUR & BLACK (HOLDINGS) LIMITED
Fairfield House 7 Fairfield Avenue
Staines Middlesex(GB)

(72) Inventor: Parlour, Noel Stanley
Sutton Bassett House Sutton Bassett
Near Market Harborough Leicestershire(GB)

(74) Representative: Gold, Tibor Zoltán et al,
T.Z.GOLD & COMPANY 9, Staple Inn
London WC1V 7QH(GB)

(54) **Machine for wrapping articles.**

(57) A wrapping machine for wrapping items of confectionery, such as lollipops (14) having an edible "pop" on a stick (15), includes various mechanisms for positioning these items in a desired configuration on a feed disc (11) and for repositioning them prior to wrapping and sealing a heat-sealable plastics material (26) around the edible "pop". A stick orienting mechanism traps the sticks in a desired position and elevates them by means of co-operating retaining members (27,28) operated by a shaft carrying a block with an angled face which is engageable by a bell-crank lever carrying an arm that engages and displaces a lollipop stick (15) into engagement with an abutment. A recess on the elevator member (27) and a recess on the counter-elevator member (28) reliably trap the stick (15) and wrapping material (26) between them, for transfer to a wrapping head.

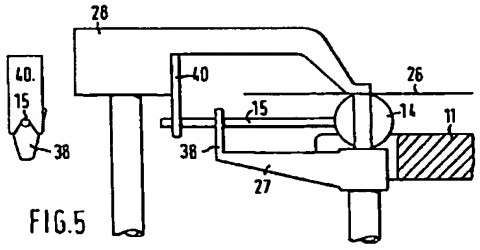

FIG.5

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MACHINE FOR WRAPPING ARTICLES

The invention relates to a machine for wrapping articles. More particularly, but not exclusively, the invention concerns a machine for wrapping small confectionery items provided with sticks, known as "lollipops".

The known "sweets" wrapping machines commonly include a continuously or intermittently rotatable main feed plate or disc provided with angularly spaced peripheral pockets rotatable from an infeed device and a transfer station adjacent the periphery of the plate or disc for transferring the lollipops together with wrapping material to a mould wheel rotatable between a lollipop-receiving station and a crimp-forming station at which the wrapping encircling the lollipops are sealed into single-end crimps or double-end crimps and from which the wrapped lollipops are discharged from the mould wheel at a discharge station.

A machine for wrapping lollipops capable of wrapping lollipops automatically at high speed

requires an efficient feeding and orienting device. In known machines feeding and orienting is generally performed by separate devices. The lollipops are fed to the main feed plate or disc with a random orientation of sticks. Lollipops in excess of the number of plate pockets are redirected radially outwardly from the central region of the main feed plate towards the pockets or are swept from outside the disc or plate by e.g. a rotary brush onto the disc or the plate. Not only is the movement of the lollipops essentially uncontrolled but also the sticks are not oriented efficiently into the desired configuration with the sticks extending generally radially. Furthermore, the known devices cannot reliably fill each and every pocket of the plate, thus lowering productivity. Also, many "pops" are broken and the sticks may also be broken or bent; the defective lollipop parts or fragments are not reliably removed from the plate; as a consequence of the heat generated in the machine; the non-removal of lollipop fragments can result in sticky or burnt-on contaminations.

The present invention seeks to overcome or reduce these disadvantages by providing a wrapping machine with a feeding/orienting device that is efficient as regards filling the main feed plate their desired configuration, and which reliably

prevents undesired excess lollipops from reaching the main feed plate.

According to a first aspect of the invention, a mechanism for positioning articles comprises two retaining memebers movable relatively to one another, and also movable together, in a first direction, the retaining members having recesses shaped so that when the retaining members are brought together in a closed position thereof the recesses co-operate to retain each article, and a displacing device operable to engage and displace the articles in a second direction, the displacing device being operable to displace each article into the path of movement of the two retaining members whilst the latter are open, the retaining members then closing so that the recesses close around the article to trap the latter in position, the retaining members then being movable together whilst closed to transfer the retained article.

The first direction is preferably substantially vertical, the displacing device then being in the form of a pivotally mounted lever which undergoes an operative pivotal movement to displace or flick the article horizontally into engagement with an abutment positioned so that the article is in the vertical path of closing movement of the two retaining members which then close

upon and grip the article. The displacing device may be operated as a result of closing movement of the two retaining members.

In a preferred application for positioning lollipops in a lollipop wrapping machine, the mechanism according to the invention is preferably arranged at a transfer station at the periphery of a feed disc. The mechanism then positions and traps the stick of each lollipop and also clamps the wrapping material against the edible pop of the lollipop, prior to the lollipop and the wrapping material being lifted away from the feed disc by means of the closed retaining members.

In another aspect of the invention, it is sought to improve the mechanism that wraps and seals heat-sealable synthetic wrapping material around the sweet or "pop". Such mechanisms usually include jaws incorporating heaters. Prior art heater jaws are rotated by a motor forming part of the machine, not only such rotation is actually required, i.e. to twist the wrapping material around the "pop", but also when no rotation is actually required. This causes excessive intertia and wear.. The prior jaws had to be moved in towards the product ("pops") while twisting, to prevent tearing the wrapping material.

In this aspect of the invention, a mechanism is

proposed in which the heater/wrapper jaws are open and stationary while the mould wheel indexes and in which the jaws do not grip the wrapping material too tightly, whereby to allow the wrapping material to slip slightly relatively to the jaws, thus reducing the risk of tearing.

According to this aspect of the invention, a mechanism for wrapping articles comprises two jaws which are mounted to move towards one another with a closing movement in order to gather wrapping material around the article and to move away from one another with an opening movement to release the wrapped articles, the jaws additionally being mounted to undergo rotational movement, whilst closed or substantially closed, in order to twist the gathered wrapping material around the article.

The jaws may be driven by a common drive member which not only drives the jaws to close or open the latter but also drives the jaws together in said rotary material-twisting movement. Preferably, said drive member is a shaft which is formed with splines co-operating with toothed segments on the jaws which are pivotally mounted about spaced parallel axes, axial displacement of the shaft in one or other direction causing the jaws to pivot towards or away from one another respectively, whilst rotation of the drive shaft causes the jaws to rotate together about the longitudinal axis of the shaft.

The drive shaft may be driven by a drive unit which imparts to the shaft a motion which is intermittent both in the axial and rotational senses, so that there is a dwell period during which the jaws are stationary and open and during which the next article to be wrapped and the wrapping therefor can be introduced between the jaws, the previously wrapped article being removed from the jaws. In the preferred application of the invention, the drive unit is driven in synchronism with the remaining operative parts of the machine.

The operative ends of the jaws which gather the wrapping material around the article are preferably formed with a V-shaped recess the sides of which assist the gathering action of the jaws close. The jaws may be provided with heating means, conveniently electrically powered resistance heating means, to heat-seal or fuse the wrapping material to itself as it is gathered and twisted. When the articles are lollipops each consisting of a stick carrying a generally spherical edible pop, the jaws preferably gather the wrapping material around the stick close to the pop.

As has already been mentioned above, a satisfactory lollipop wrapping machine requires an orderly orientation of the sticks before the wrapping can commence.

According to an aspect of the invention relating to stick orientation, there is provided a mechanism for orienting lollipops each having a stick carrying a pop, comprises a feed member having a plurality of regularly spaced recesses for accommodating the individual pops, two brushes mounted for rotation in mutually opposite directions about substantially parallel axes, and means for moving the feed member with respect to the brushes to cause the recesses to pass between the brushes so that in use the brushes engage the lollipops and position their sticks in a regular orientation.

Preferably, the feed member is an intermittently rotatable feed disc having the recesses arranged around its periphery, the brushes being positioned and driven to engage the "pops" as the latter pass between the two brushes, so that the sticks project in the same radial direction (relative to the axis of rotation of the feed disc) from the "pops". This may conveniently be achieved by arranging the rotational axis of the feed disc to be perpendicular to the parallel axes of the oppositely rotating brushes.

In a preferred embodiment to be described hereinafter, the two brushes are mounted about vertically spaced horizontal axes, the upper of the two brushes being shorter in the direction of its rotational axis than the lower brush.

According to a further aspect of the present invention, there is provided a confectionery wrapping machine comprising a rotatable multi-pocketed main feed plate or disc, an infeed device located in proximity to the main feed plate or disc, and means defining a gate between said infeed device and main feed plate or disc for the passage of items of confectionery from said infeed device to the main feed plate or disc at a controlled rate, said means being effective to repel items of confectionery in excess of said controlled rate away from the main feed plate or disc, back generally towards the said device.

Preferably, said infeed device is a rotatable disc or plate. It may be rotated continuously or intermittently. In the latter case, it may be geared at a suitable transmission ratio to be driven with the intermittently rotated (indexing) main feed plate or disc, although if convenient it could be provided with its own drive motor. In the former case it is preferably provided with its own drive motor.

The infeed device is preferably a conical plate tapering upwardly to its centre so that on rotation thereof items of confectionery will be urged radially outwardly by the combined effects of gravity and centrifugal forces. In an alternative, however, the infeed device is a flat rotary disc and centrifugal forces alone are relied on.

Preferably, the infeed and main discs are located closely contiguously and are rotated in opposite angular senses, the gate-defining means is preferably located at a sector of the main disc which constitutes an entry station and is preferably a rotary member, e.g. a brush, located above the said sector such that a small spacing or gap exists between the outer (envelope) surface of the member and the upper surface of the main feed disc; alternatively, there may be no such gap at all but the member is of yieldable material, e.g. the "bristles" of the brush, thus to enable the passage therepast or therethrough of small items of confectionery. The said member is preferably rotated, e.g. continuously, in an angular direction such that at the top surface of the main disc it opposes the oncoming stream of "sweets" or lollipops.

The gate-defining means preferably also includes guide baffles positioned at the axial ends of the rotary brush and extending from one of said ends to define a buffer zone for receiving excess lollipops.

The rotary gate brush not only controls the rate of passage of lollipops such that (by suitably co-ordinating items r.p.m. with the rotational velocity of the main disc) each pocket of the main feed disc is duly filled, but it also "flicks" the lollipops, or in other words provides a preliminary orientation

to them. By and large, after passage through the gate brush and location of the "pop" in the pockets the sticks will extend from the pockets in a generally radially outward or tangential direction, even if not diametrally, and there will be few if any sticks oriented radially inwardly. To complete the orientation of the lollipop sticks into the above-mentioned desired configuration, an orienting mechanism is preferably provided, located "downstream" of the gate device.

The mechanism of this aspect of the invention essentially consists of a rotary brush mounted generally tangentially with respect to and closely contiguously above the periphery of the main feed disc, and means for rotating the brush so that it sweeps the peripheral pockets of the main disc in a radially outward direction (as seen from the main feed disc).

Although one such brush mounted above the main feed disc may be sufficient, in another preferred embodiment two such brushes are provided, positioned respectively above and below the periphery of the main feed disc so as to "sandwich" the latter, the two brushes being arranged to contra-rotate about substantially parallel axes.

A lollipop wrapping machine according to the invention will now be described merely by way of example, with reference to the accompanying drawings,

in which :-

Figure 1 is a fragmentary side elevation showing part of a lollipop stick orienting mechanism arranged at the periphery of a feed disc of the lollipop wrapping machine,

Figure 2 is a view of the mechanism looking in the direction of the arrow A in Figure 1,

Figure 3 is a view similar to that of Figure 2, but showing the mechanism in an alternative operational position,

Figure 4 is a side elevation similar to that of Figure 1 but showing additional parts of the mechanism, two retaining members of the mechanism shown in the open position,

Figure 5 is a side elevation similar to that of Figure 4 but showing the retaining members is a closed position,

Figure 6 is a side view of a twist-wrapping mechanism forming part of the machine,

Figures 7 and 8 are respectively side and plan views of one of two jaws of the mechanism of Figure 6,

Figure 9 is a side view of a heating element which is mounted in each of the two jaws,

Figure 10 is a plan view of an orienting mechanism for a feed disc, forming part of the machine,

Figure 11 is a fragmentary view of the orienting mechanism looking in the direction of arrow B in Figure 10,

Figure 12 is a view of the mechanism looking in the direction of the arrow C in Figure 10,

Figure 13 is a top plan view of a wrapping machine according to the invention,

Figure 14 is a side view of one preferred embodiment of the machine shown in Figure 13, and

Figure 15 is a side view of another preferred embodiment of the machine shown in Figure 13.

Referring to Figure 1, a feed disc 11 is mounted for stepwise rotation about a vertical axis (shown at 12' in Figure 10) and has around its circumference a plurality of pockets or recesses 13 each accommodating the substantially spherical pop 14 of a lollipop the stick 15 of which projects radially outwardly from the pop 14. At a transfer station the lollipops are brought into engagement with the wrapping material (shown at 26 in Figures 4 and 5) each lollipop and its wrapping material then being lifted away from the feed disc 11 by means of two retaining members in the form of an elevator member 27 and a counter-elevator member 28. The members 27 and 28 deliver the lollipops and wrapping material to a wrapping head, not shown.

It is important that the sticks 15 are positioned uniformly and regularly prior to transfer of the lollipops away from the feed disc, and the mechanism disclosed herein seeks to achieve this object by first accurately positioning the lollipop sticks 15

and then clamping them in position between the elevator member 27 and counter-elevator member 28.

Referring to Figure 1, as each lollipop is brought in turn to the transfer station, the stick 15 moves between tow horizontally extending and vertically spaced stick guides 29. When each lollipop is brought to the transfer station, the members 27 and 28 are open, the member 27 being stationary and disposed below the member 28 which then commences its downward closing movement towards the member 27. The member 28 is attached to a shaft 30 (Figure 2) carrying a block 31 having an angled face 32 which, as the block 31 descends, engages a cylindrical projection 33 formed on a bell-crank lever 34 pivoted about a horizontal axis 35. The bell-crank lever 34 carries an angled extension arm 36, which on operative pivotal movement of the bell-crank lever 34, engages and displaces the lollipop stick 15 to move the latter into engagement with an abutment 37. The lollipop stick 15 is now in the position shown in Figure 3 and is positioned centrally in the line of vertical movement of the members 27 and 28.

As can be seen from the fragmentary views at the left-hand side of Figure 4, the elevator member 27 has an arm carrying an upturned tip 38, formed with a recess 39 of asymmetrical V-shape. The counter-elevator member 28 carries a projecting

member 40 having a recess 41 of inverted V-shape; as the counter-elevator 28 moves downwards and the members 27 and 28 close, the stick 15 is received and trapped within the two recesses 39 and 41, so that it is firmly held in position, as shown in Figure 5. This closing movement of the members 27 and 28 also clamps the wrapping material 26 against the edible pop 14. The two members 27 and 28 with the lollipop and the wrapping material clamped therebetween then move as a unit with a lifting motion to the wrapping head at which the lollipop is wrapped with the wrapping material.

It will be appreciated that the lever arm 36 flicks each lollipop stick 15 into the position shown in Figure 3 so that it is reliably captured between the two recesses 39 and 41, as the members 27 and 28 close.

Referring to Figure 6, a twist-wrapping mechanism comprises two jaws or arms 51 and 52 pivotally mounted about horizontally spaced and horizontally extending parallel axes 53 and 54. Adjacent the pivot axis, each jaw is formed with a toothed segment which engages a toothed rack 55 formed on the end of a drive shaft 56. The drive shaft 56 is driven in both the rotational and translational sense by means of a drive unit comprising a power shaft 57 linked to the drive shaft 56 by means of an indexing mechanism 58 and a gear train 59 consisting of spur gears, one of which is mounted on an intermediate shaft 70.

The shaft 70 carries at its lower end a cam 71 which co-operates with a cam follower 72 in such manner that when the intermediate shaft 70 rotates, a lever 73 pivots at one end thereof about a horizontal pivot axis 74 first in one rotational direction and then in the opposite rotational direction. The other end of the lever 73 is pivoted at 75 to the lower end of the drive shaft 56 so that the motion transmitted through the gear train 59 not only rotates the drive shaft 56 but also translates the latter up-and-down as shown by the double-headed arrow AA in Figure 6.

The rotational and translational motion imparted to the drive shaft 56 causes the jaws 51 and 52 to move towards one another with a closing movement and then away from one another with an opening movement, the jaws simultaneously rotating about the longitudinal axis if the drive shaft 56. Each jaw is shaped as shown in Figures 7 and 8, the end of the jaw remote from the pivot axis carrying two spaced fingers 76 each having a V-shaped recess 77. When the jaws 51, 52 are closed the fingers 76 of the jaws interdigitate, as shown in full lines in Figure 6. The fully open position of the jaws 51, 52 is shown in broken lines in Figure 6.

Lollipops each consisting of a stick 15 carrying a generally spherical edible pop 14 received within an open sleeve 26 of wrapping material, are delivered in turn to a position between the open jaws 51, 52.

Thereafter, the jaws close upon the wrapping material 26 and gather the latter around the stick 15 immediately below the pop 14, the rotation of the jaws 51, 52 about the longitudinal axis of the drive shaft 56 causing the gathered wrapping material to be twisted around the stick 15 so that the wrapping material 26 is engaged firmly around the pop 14. Each jaw is provided with an electrical resistance heating element 81 (Figure 9) which on energisation from a source, not shown, transfers heat to the fingers which in turn heat-seal or fuse the folds of the wrapping material 26 around the stick 15. The jaws 51, 52 are then opened and the wrapped lollipop is moved away from its location between the jaws which are then ready to receive the subsequent lollipop.

The indexing mechanism 58 is arranged to cause intermittent motion to be transmitted to the drive shaft 56 so that there is a dwell period during which the jaws 51, 52 are stationary and open and during which the wrapped lollipop is removed from the jaws and the next lollipop is moved therebetween.

Referring to Figure 10, there is shown a feed disc 11 rotatable (by means not shown) about a central vertical axis 12' and having around its periphery a plurality of regularly spaced pockets or recesses 13 for accommodating e.g. lollipops. The feed disc 11 is rotated in a step-wise manner so that each recess or pocket 13 is positioned in turn beside a feed station

at which the lollipops are loaded on the disc 11.

The edible pops are received and supported within and appropriately shaped recesses but the sticks project from the pops in random directions as indicated at 150 in Figure 10.

As the disc rotates in a step-wise manner (counter-clockwise as viewed in Figure 10), the lollipops move past an orienting station at which is located the orienting mechanism 16 embodied in the present invention. After orientation by the mechanism 16 in the manner described below, the oriented lollipops continue in their rotational travel before being removed from the feed disc at an unloading station 18.

The orienting mechanism 16 comprises two brushes 19 and 20 which are more clearly seen in Figures 11 and 12. The brushes 19 and 20 are rotatably mounted about vertically spaced horizontal axes and are driven by means not shown in mutually opposite angular directions. At the point of nearest approach to the feed disc 11 (Figure 11) adjacent portions of the brushes 19, 20 move tangentially to the disc 11 in a direction which is radially outward as viewed from the feed disc 11.

As can be seen from Figures 10 and 12, the upper brush is shorter in the longitudinal direction of its axis of rotation than the lower brush 20. The two brushes form part of a unit mounted beside the feed disc in such a manner that the recesses 13 pass between the two

brushes 19 and 20 as the feed disc 11 rotates. The unit has a casing 21 from which project respective drive shafts 22 for each brush.

When the feed disc 11 loaded with lollipops, moves in a step-wise manner between the contra-rotating brushes 19 and 20, the combination of this step-wise movement with the opposite rotational influence of the brushes 19 and 20 on the pop 14 (Figures 11 and 12) causes each stick 15 to be moved or flicked so that its stick entends radially outwardly from the pop, with respect to the vertical rotational axis 12' of the feed disc 11. Hence all the lollipops which have been moved through the brushes 19 and 20 are regularly oriented with their sticks projecting radially outwardly, as shown at 17 in Figure 10 and also in Figures 11 and 12.

Referring now to Figures 13 and 14, there is shown a part of a lollipop wrapping machine 10. Five main components are illustrated, namely a hopper 110, an infeed disc 120, a gate assembly 130, a main feed disc 11 and an orienting mechanism 115.

The hopper 110 may be of any suitable construction to discharge lollipops 14 to the surface of the infeed disc 120. In this embodiment, see Figure 14, the infeed disc 120 is a conical disc supported on an arm 117 secured to the main machine frame 118 and rotated by its own motor 119 in an angular direction opposite to the direction of (intermittent) rotation of the main feed disc 11. The peripheries of the discs 120,

11 are in close contiguity.

The main feed disc 11 has a plurality of angularly equispaced peripheral pockets 13 for receiving a lollipop 14. Each pocket 13 has an arcuate seat 121 for receiving the "pop" portion 14 of a lollipop and a throughgoing straight-sided recess 23 for receiving the stick 15 of the lollipop.

An angular section 125 of the main feed disc 11 is fenced off by a baffle 126 which extends above the disc 11. The baffle 126 has two spaced-apart straight end portions 127, 128. From the first end portion 127 the baffle extends in a circular arc section 129 above the disc 11 and radially inwardly from its edge, going over into a straight portion 300 towards the infeed disc 12 and then into a curved section 310 above, and then follows the contour of the infeed disc, terminating in the said end portion 128. The disc 120 and the sections 129, 300 define a cusp-shaped space 320. A fixed surface (not shown) is provided as a "bottom" to this space 320, which thus becomes a storage or buffer zone.

The gap between the straight portions 127, 128 is filled by a rotary brush 330 continuously rotated by means not shown, e.g. a electric motor or a geared connection from motor 119. As the curved arrow indicates, the brush 330 is positioned generally tangentially above and so as to touch, the outer periphery of the feed discs 11, 120. Its direction

of rotation is such as to sweep the outer periphery of disc 120 in a generally radially outward direction, as seen from the main feed disc 11 and in a generally radially inward direction as seen from the infeed disc 120.

In operation, by a suitable selection of the drive speeds of the discs 11, 120 and of the brush 330, and by a suitable selection of the position of the brush and the "yieldingness" of its bristles, it can be arranged that the rate of passage of lollipops under and through the brush corresponds with the rate at which the pockets 13 of the main feed disc 11 present themselves to receive lollipops. The excess is then swept back to the infeed disc 120 and/or to the buffer zone 320.

Figure 13 shows that lollipops passing under the brush 330 emerge seated in the pockets 13 with their sticks 15 in a radially random orientation. However, this random orientation is less than totally "random" in that the majority of the sticks 15 are found to lie radially outwardly of the edible "pop" portions 14. Thus the brush 330 provides a degree of preliminary orientation.

To ensure that the sticks 15 take up their desired configuration with the sticks 15 lying in diametral planes within the recesses 23, an orienting mechanism 15 is provided, as has already been mentioned. The mechanism 115 consists of a pair of contra-rotating

cylindrical brushes 340, 350, shown in chain lines only in Figures 14 and 15. The brushes 340, 350 are essentially similar in the concept of their operation to the brushes 19, 20 of Figure 10. They extend generally tangentially with respect to the main disc 11, with their axes of rotation parallel and horizontal, and so as to sweep the periphery of the disc 11, whereby to cause the sticks 15 to drop and be held in the recesses 23. The driving means for the brushes 340, 350 are not shown.

Although in Figures 14 and 15 two such brushes 340, 350 are shown, Figure 13 shows only one brush, the top brush 340. In many cases a single brush 340 provides a completely satisfactory orienting mechanism.

The Figure 15 embodiment differs from the Figure 13 embodiment essentially in that the infeed disc 120 is not a conical disc but a flat disc 360 and that it is driven by a gear connection 370 from the drive means 380 of the main disc 11.

CLAIMS

1. A wrapping machine including a mechanism for positioning articles, characterised in that said mechanism consists of two retaining members (27, 28) movable relatively to one another and also movable together in a first direction, the retaining members (27, 28) having recesses (13) shaped so that when the retaining members (27, 28) are brought together in a closed position thereof the recesses (13) co-operate to retain each article (14, 15), and a displacing device (30-34)operable to engage and displace the articles (14,15) in a second direction, the displacing device (30-34) being operable to displace each article(14,15) into the path of movement of the two retaining members (27,28)whilst the latter are open, the retaining members (27,28) then closing so that the recesses (13) close around the article (14, 15) to trap the latter in position, the retaining members (27,28) then being movable together whilst closed to transfer the retained article.

2. A machine according to Claim 1, characterised in that the first direction is substantially vertical, the displacing device being in the form of a pivotally mounted lever (34) which undergoes an operative pivotal movement to displace or flick the article (14,15) horizontally into engagement with an abutment (37)

positioned so that the article (14,15)is in the vertical path of closing movement of the two retaining members (27,28) which then close upon and grip the article; the displacing device being operable as a result of closing movement of the two retaining members (27,28).

3. A maching according to Claim 1 or Claim 2 characterised in that it includes a wrapping and heat-sealing mechanism that has two jaws (51,52) associated with heaters (81), said jaws (51,52) being mounted for movement towards one another with a closing movement in order to gather wrapping material (26) around the article (14,15) and to move away from one another with an opening movement to release the wrapped articles (14,15), the jaws (51,52) additionally being mounted to undergo rotational movement, whilst closed or substantially closed, in order to twist the gathered wrapping material (26) around the article (14,15).

4. A machine according to Claim 3 characterised in that the jaws (51,52)are driven by a common drive member (56) which not only drives the jaws (51,52) to close or open the latter but also drives the jaws (51,52) together in said rotary material-twisting movement.

5. A machine according to Claim 4 characterised in that said drive member (56) is a shaft formed with a rack (55) co-operating with toothed segments on the jaws (51,52) which are pivotally mounted about spaced parallel axes, axial displacement of the

shaft (56) in one or other direction causing the jaws (51,52) to pivot towards or away from one another respectively, whilst rotation of the drive shaft (56) causes the jaws (51,52) to rotate together about the longitudinal axis of the shaft (56).

6. A machine according to Claim 5 characterised in that the drive shaft (56) is driven by a drive unit (57-59) which imparts to the shaft (56) a motion which is intermittent both in the axial and rotation senses, so that there is a dwell period during which the jaws (51,52) are stationary and open and during which the next article (14,15) to be wrapped and the wrapping material (26) therefor can be introduced between the jaws (51,52), the previously wrapped article (14,15) being removed from the jaws (51,52), and in that the operative ends of the jaws which gather the wrapping material (26) around the article (14,15) are each formed with a V-shaped recess (77) the sides of which assist the gathering action of the jaws close.

7. A machine according to any preceding claim characterised in that it includes a lollipop stick orienting mechanism consisting of a feed member (11) having a plurality of regularly spaced recesses (13) for accommodating the individual "pops" (14,15), two brushes (19,20) mounted for rotation in mutually opposite directions about substantially parallel axes, and

means for moving the feed member (11) with respect to the brushes (19,20) to cause the recesses (13) to pass between the brushes (19,20) so that in use the brushes (19,20) engage the lollipops (14,15) and position their sticks (15) in a regular orientation; and in that the feed number (11) is an intermittently rotatable feed disc (11) having the recesses (13) arranged around its periphery, the brushes (19,20) being positioned and driven to engage the "pops" as the latter pass between the two brushes, so that the sticks (15) project in the same radial direction relative to the axis of rotation of the feed disc (11) from the "pops", by arranging the rotational axis of the feed disc (12') to be perpendicular to the parallel axes of the contra-rotating brushes (19,20),

8. A machine according to Claim 7 characterised in that the two brushes (19,20) are mounted about vertically spaced horizontal axes, the upper brush (19) of the two brushes being shorter in the direction of its rotational axis than the lower brush (20).

9. A machine according to any preceding claims characterised in that it includes a rotatable multi-pocket d main feed plate or disc (11), an infeed device (120) located in proximity to the main feed plate or disc (11), and means defining a gate (130) between said infeed device (120) and main feed plate or disc (11) for the passage of items of confectionery

(14,15) from said infeed device (120) to the main feed plate or disc (11) at a controlled rate, said means (130) being effective to repel items of confectionery (14,15) in excess of said controlled rate away from the main feed plate or disc (11), back generally towards the said device.

10. A machine according to Claim 9 characterised in that the infeed and main discs (120,11) are located closely contiguously and are rotated in opposite angular senses, the gate-defining means is a rotary brush (330) located either with a small gap above a sector of the main disc which constitutes an entry station or with no such gap but having yielding bristles enable the passage therepast or therethrough of small items of confectionery, the brush being arranged to rotate continuously in an angular direction such that at the top surface of the main disc it opposes the oncoming stream of said items.

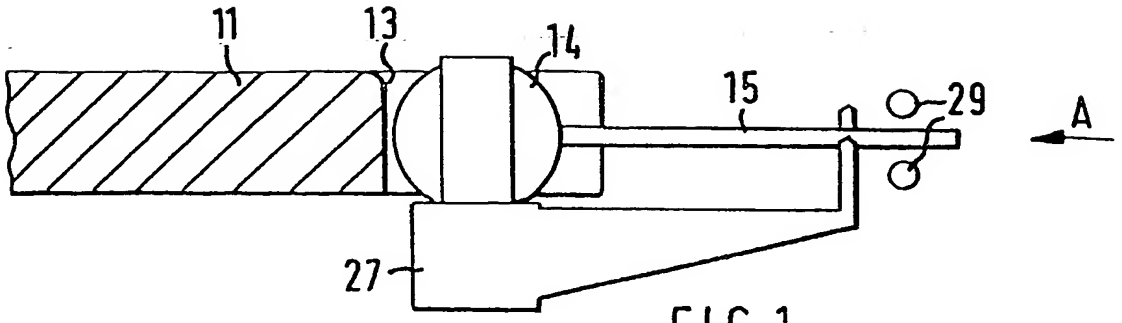

FIG.1

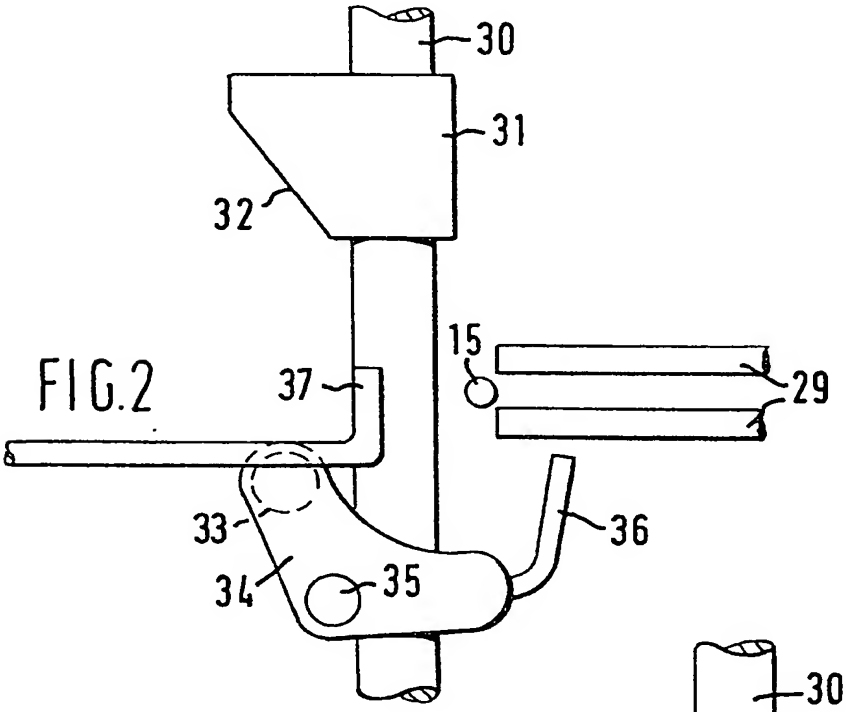

FIG.2

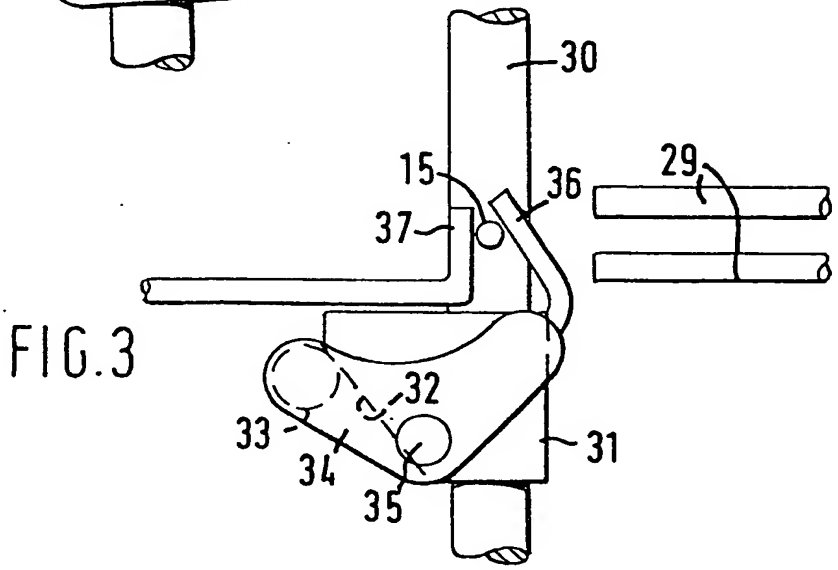

FIG.3

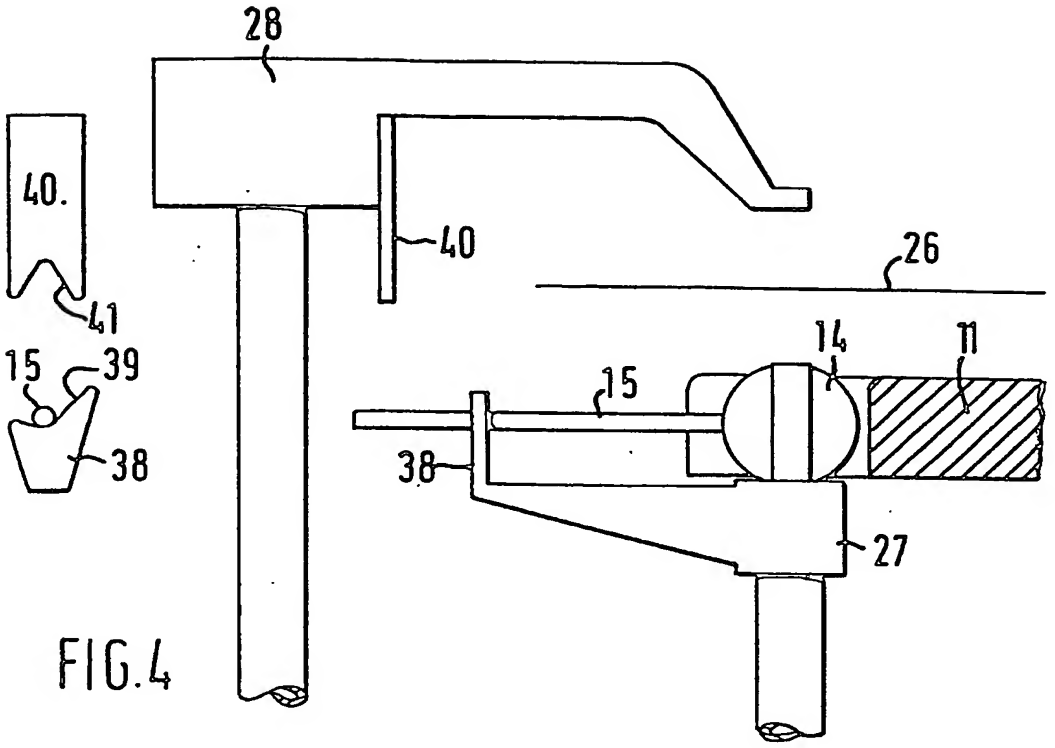

FIG.4

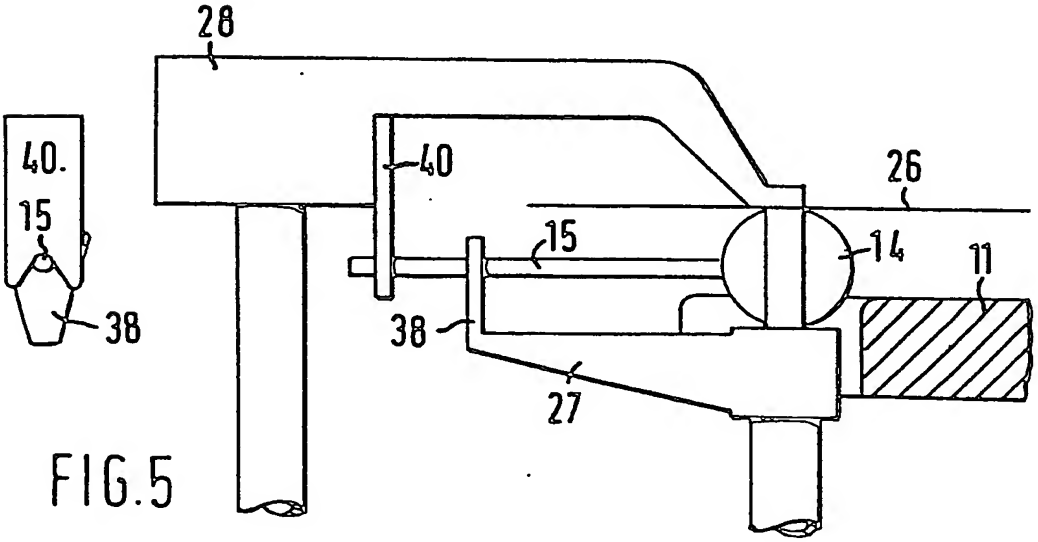

FIG.5

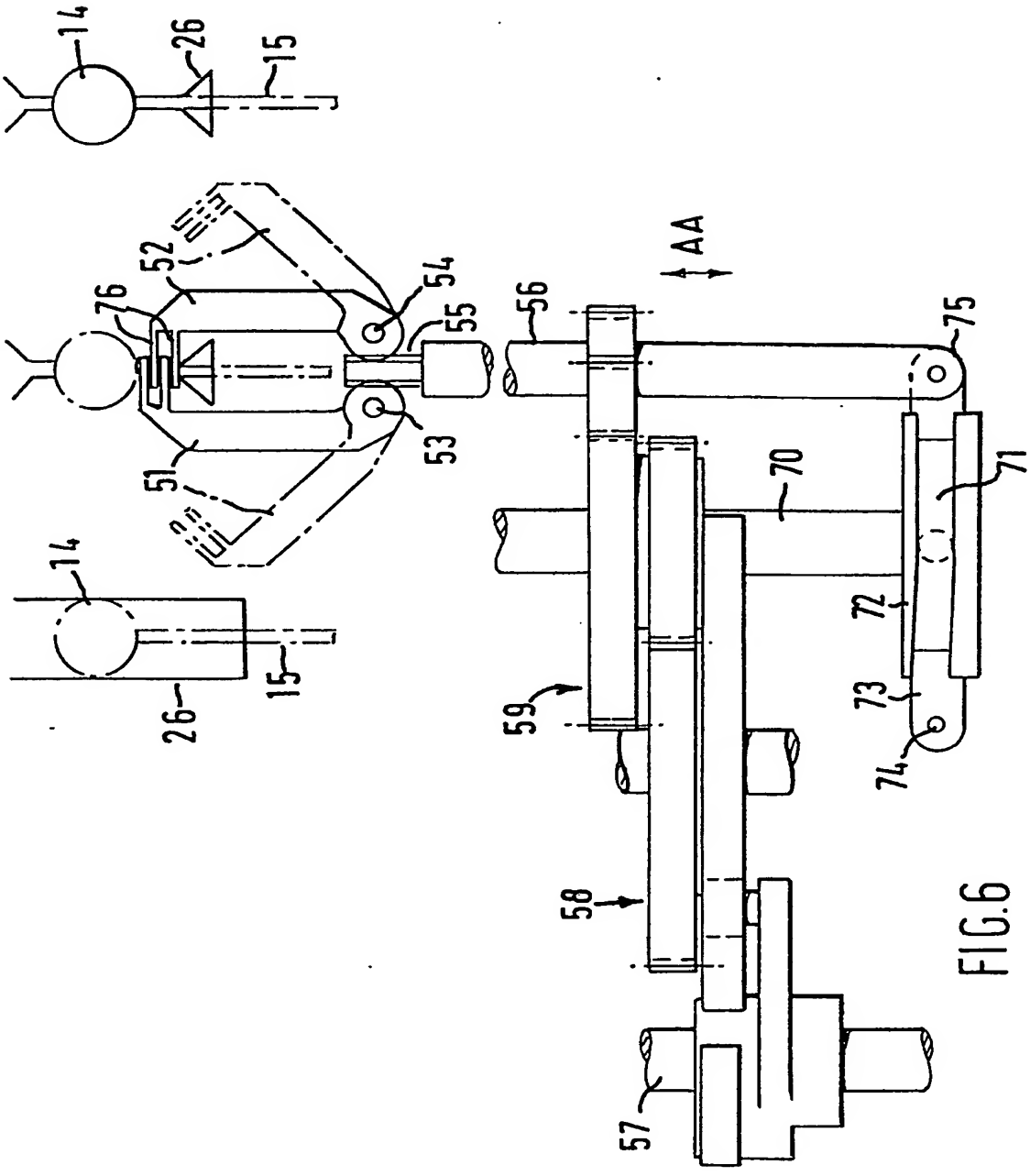

FIG.6

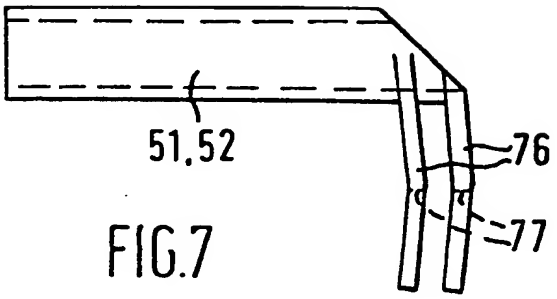

FIG.7

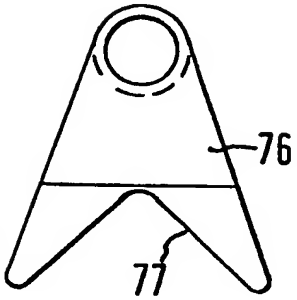

FIG.8

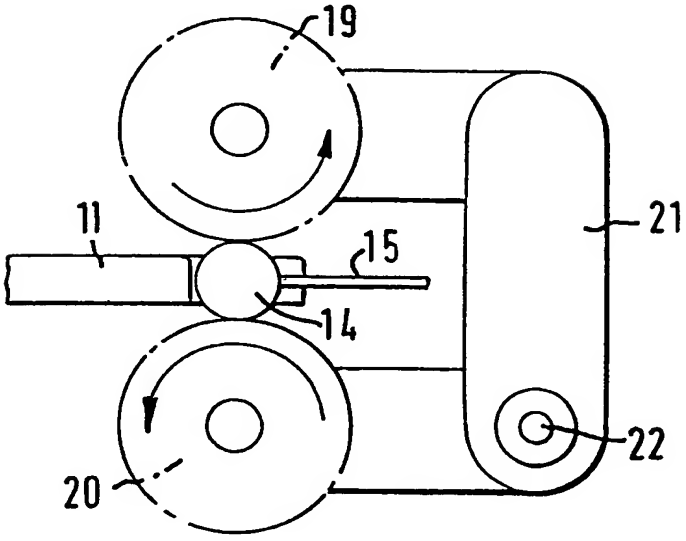

FIG.11

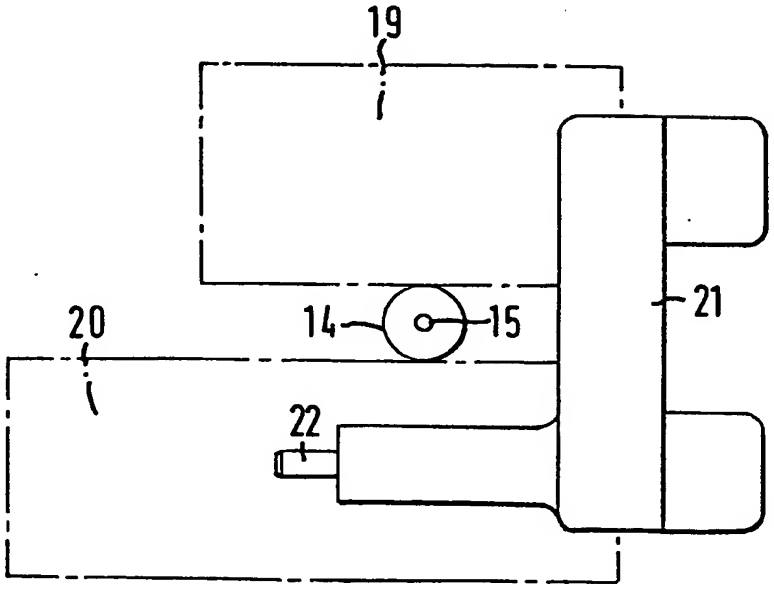

FIG.12

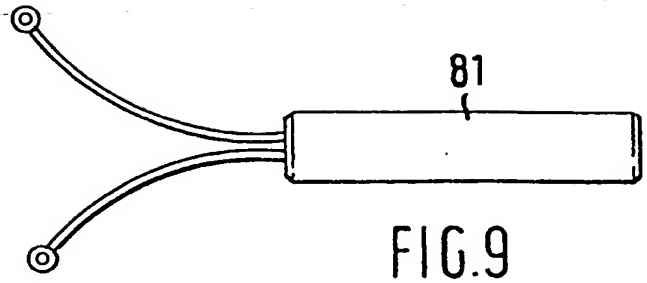

FIG.9

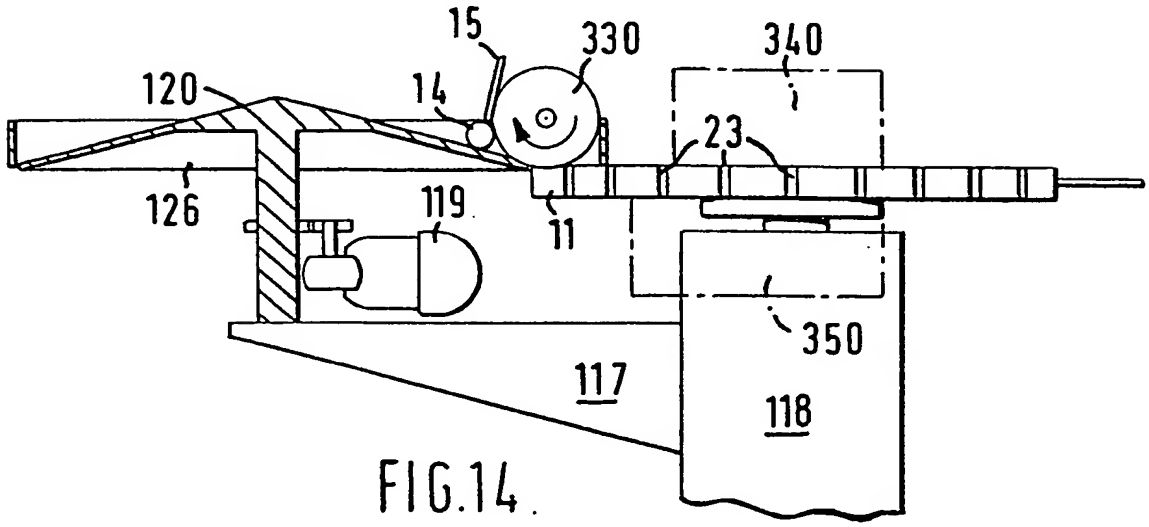

FIG.14.

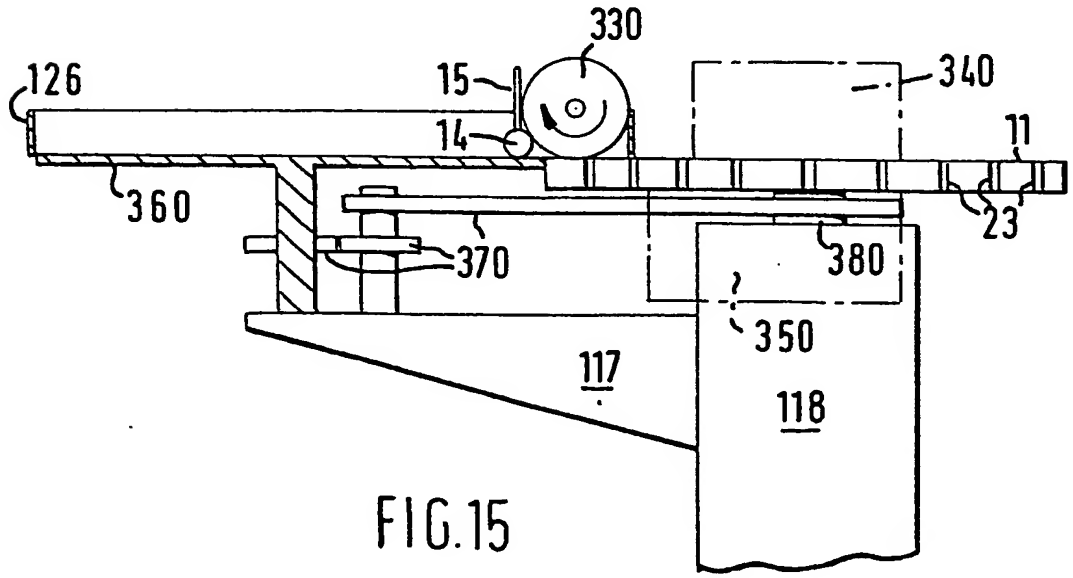

FIG.15

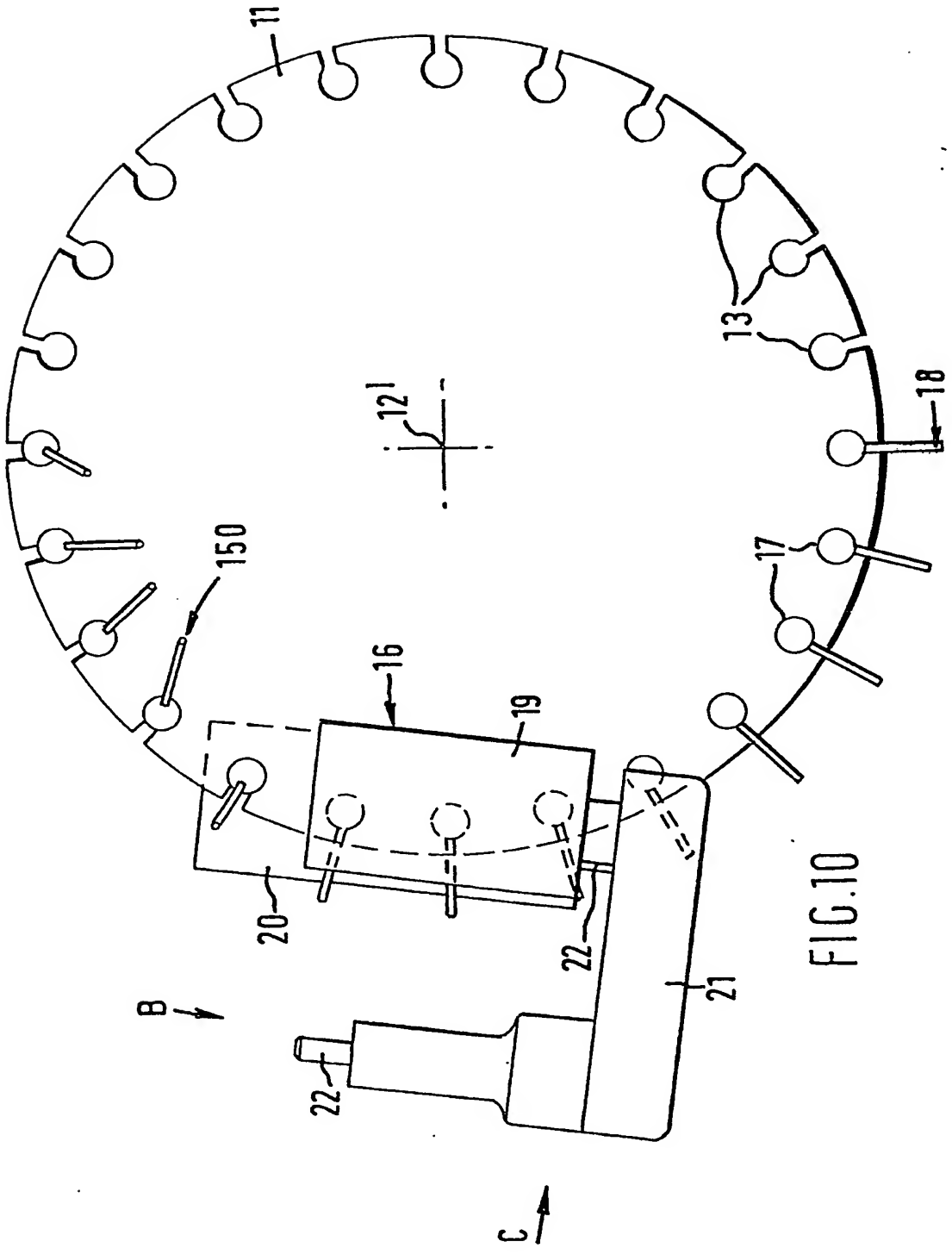

FIG.10

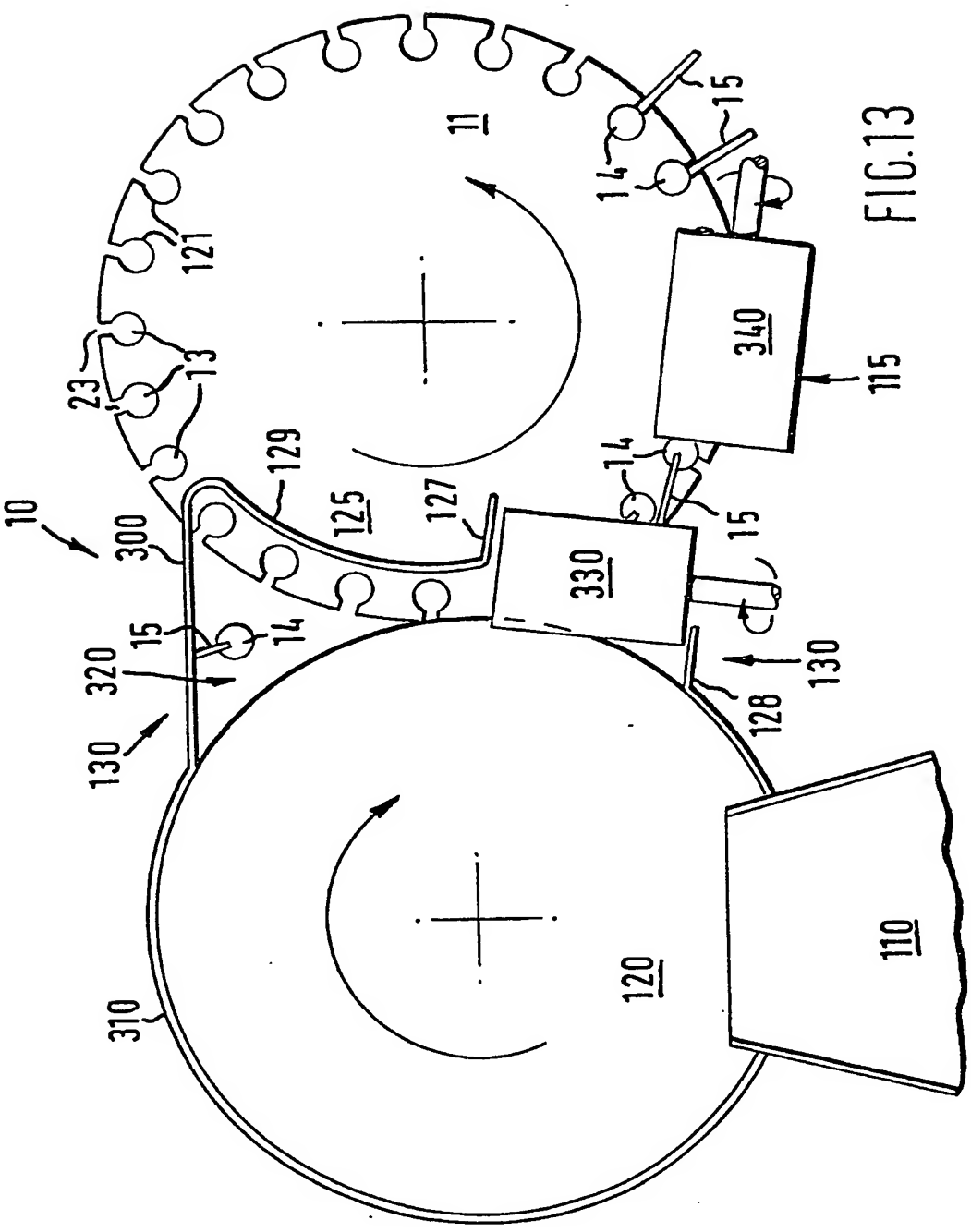
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FIG.13

0036282

European Patent Office

EUROPEAN SEARCH REPORT

Application number
EP 81300988.3

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim
A	DD - A - 135 604 (E. WECKEND)	3-6
A,P	DE - A1 - 2 941 926 (CARLE & MONTANARI S.P.A.) & BE- 879 431 (15-02-1980) & GB-A -2 036 680 (02-07-1980) & FR-A1-2 439 132 (16-05-1980) & NL-A -7 907 698 (22-04-1980)	1-2
A	US - A - 4 024 058 (DERCKX)	7,10
A	GB - A -729 223 (ROSE BROTHERS)	7,9,10
A	GB - A - 699 422 (G.D. SOCIETA ANONIMA)	3-6

CLASSIFICATION OF THE APPLICATION (Int. Cl.³)

B 65 B 11/44
B 65 B 35/56

TECHNICAL FIELDS SEARCHED (Int. Cl.³)

B 65 B 11/00
B 65 B 35/00
B 65 B 49/00
B 65 B 51/00

CATEGORY OF CITED DOCUMENTS

X: particularly relevant
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T: theory or principle underlying the invention
E: conflicting application
D: document cited in the application
L: citation for other reasons

&: member of the same patent family, corresponding document

X The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
VIENNA	27-05-1981	MELZER

EPO Form 1503.1 06.78